

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

<b>Date of mailing</b> (day/month/year) 11 December 2000 (11.12.00)	
<b>International application No.</b> PCT/US00/01824	<b>Applicant's or agent's file reference</b> 1088
<b>International filing date</b> (day/month/year) 21 January 2000 (21.01.00)	<b>Priority date</b> (day/month/year) 22 January 1999 (22.01.99)
<b>Applicant</b> HERSCHEID, Jacobus, D., M. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
22 August 2000 (22.08.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer C. Cupello Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 25 MAY 2001

WIPO

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14

Applicant's or agent's file reference 1088	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/01824	International filing date (day/month/year) 21 JANUARY 2000	Priority date (day/month/year) 22 JANUARY 1999
International Patent Classification (IPC) or national classification and IPC IPC(7): B01D 59/26; C01B 7/14 and US Cl.: 423/249		
Applicant MALLINCKRODT INC.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 22 AUGUST 2000	Date of completion of this report 20 APRIL 2001
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer STEVEN BOS DEBORAH THOMAS PARALEGAL SPECIALIST
Facsimile No. (703) 305-3230	Telephone No. 703-308-0661

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/01824

**I. Basis of the report****1. With regard to the elements of the international application:\***☒ the international application as originally filed☒ the description:

pages 1-24 , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_

☒ the claims:

pages 25-27 , as originally filed  
pages NONE , as amended (together with any statement) under Article 19  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_

☒ the drawings:

pages 1-4 , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_

☒ the sequence listing part of the description:

pages NONE , as originally filed  
pages NONE , filed with the demand  
pages NONE , filed with the letter of \_\_\_\_\_

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.**4. ☒ The amendments have resulted in the cancellation of:**☒ the description, pages NONE☒ the claims, Nos. NONE☒ the drawings, sheets/fig NONE**5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/01824

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. statement

Novelty (N)

Claims 1-30 YES  
Claims NONE NO

Inventive Step (IS)

Claims 1-30 YES  
Claims NONE NO

Industrial Applicability (IA)

Claims 1-30 YES  
Claims NONE NO

### 2. citations and explanations (Rule 70.7)

Claims 1-30 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest the combination of process steps instantly claimed, especially the use of a d10 metal in the process. Also, the prior art does not teach or fairly suggest the use of a nonactivated metal surface; the use of platinum as adsorbent metal; activation of the metal by hydrogen; sulfuric acid as the acidic solution; the use of an alkaline solution or formate as eluent in the instantly claimed process, nor the apparatus including a column containing a metal and means for activating the metal for purifying radioisotopes while the claims have industrial applicability for purifying radioisotopes.

----- NEW CITATIONS -----

NONE

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>1088</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 00/ 01824</b>	International filing date (day/month/year) <b>21/01/2000</b>	(Earliest) Priority Date (day/month/year) <b>22/01/1999</b>
Applicant <b>MALLINCKRODT INC. et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No.

US 00/01824

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7: B01D59/26 C01B7/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B01D C01B G21F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Section Ch, Week 7751 Derwent Publications Ltd., London, GB; Class K08, AN 77-90911Y XP002109381 & JP 52 133498 A (JAPAN ATOMIC ENERGY RES INST), 8 November 1977 (1977-11-08) abstract --- -/--	1-8, 11, 18, 19, 25



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## ° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance  
 "E" earlier document but published on or after the international filing date  
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)  
 "O" document referring to an oral disclosure, use, exhibition or other means  
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention  
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone  
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.  
 "&" document member of the same patent family

Date of the actual completion of the international search

7 June 2000

Date of mailing of the international search report

15/06/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Cubas Alcaraz, J

## INTERNATIONAL SEARCH REPORT

International Application No

US 00/01824

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CHEMICAL ABSTRACTS, vol. 86, no. 18, 2 May 1977 (1977-05-02) Columbus, Ohio, US; abstract no. 129442a, ARINO ET AL.: "Separation and purification of radioiodine using platinum-coated copper granules" page 532; XP002109378 abstract & INT. J. APPL. RADIAT. ISOT., vol. 27, no. 11, 1976, pages 637-641, ---	1-10, 13, 18-21, 25-29
A	CHEMICAL ABSTRACTS, vol. 98, no. 18, 2 May 1983 (1983-05-02) Columbus, Ohio, US; abstract no. 151386e, XU ET AL.: "A selective adsorption method for iodine and its radiochemical applications. I. Adsorption and desorption of iodine on copper-based platinum adsorbent" page 494; XP002109379 abstract & HE HUAXUE YU FANGSHE HUAXUE, vol. 5, no. 1, 1983, pages 9-17, ---	1-11, 13, 14, 18-21, 25-27
A	CHEMICAL ABSTRACTS, vol. 90, no. 26, 25 June 1979 (1979-06-25) Columbus, Ohio, US; abstract no. 211942e, MAKHKAMOVA ET AL.: "Adsorption separation of iodine isotopes without a carrier" XP002109380 abstract & TEZISY DOKL. - KONF. ANAL. KHIM. RADIOAKT. ELEM, vol. 28, 1977, Moscow ---	1-10, 13, 18-21, 24-27
A	US 4 387 303 A (BENJAMINS HARM M) 7 June 1983 (1983-06-07) claims 1-11 -----	28-30

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

US 00/01824

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 52133498	A	08-11-1977	JP 1151010 C	14-06-1983
			JP 57039172 B	19-08-1982
US 4387303	A	07-06-1983	NL 7902342 A	30-09-1980
			AT 379252 B	10-12-1985
			AT 908980 A	15-04-1985
			AU 533194 B	10-11-1983
			AU 5682780 A	02-10-1980
			BE 882456 A	16-07-1980
			CA 1143872 A	29-03-1983
			CH 650355 A	15-07-1985
			DE 3038753 C	10-01-1991
			DE 3038753 T	11-02-1982
			DK 501680 A,B,	25-11-1980
			FR 2452767 A	24-10-1980
			GB 2070319 A,B	03-09-1981
			IL 59617 A	31-07-1983
			IT 1128075 B	28-05-1986
			JP 56500312 T	12-03-1981
			JP 63061640 B	29-11-1988
			WO 8002082 A	02-10-1980
			NL 8020105 T	01-07-1981
			SE 447521 B	17-11-1986
			SE 8102620 A	24-04-1981
			ZA 8001749 A	25-03-1981



**FOR THE PURPOSES OF INFORMATION ONLY**

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DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

XP-002109378

6001 Chemical Abstracts, Columbus, Ohio, US

Vol: 86 (1977) 2 may No. 18

Page: 532

86: 129442a Separation and purification of radioiodine using platinum-coated copper granules. Arino, Hirofumi; Kramer, Henry H. (Corp. Res. Dep., Union Carbide Corp., Tuxedo, N. Y.). *Int. J. Appl. Radiat. Isot.* 1976, 27(11), 637-41 (Eng). A new sepn. and purifn. method was developed for radioactive iodine using a column chromatog. technique utilizing Pt-coated Cu (PCC) granules as the adsorbent. A dil. H<sub>2</sub>SO<sub>4</sub> soln. contg. the radioactive iodine isotope is passed through a small PCC column. The I is selectively retained and all other impurities pass through the column. The I is then quant. recovered in a dil. NaOH eluant. The novelty of this method is the extremely high selectivity of the PCC system for I and in the simplicity of operation.

ILL 10/7/03

XP-002109379

Vol: 98 (1983) 2 may No. 18Page: 494

98: 151386e A selective adsorption method for iodine and its radiochemical applications. I. Adsorption and desorption of iodine on copper-based platinum adsorbent. Xu, Xin; Luo, Xuezhong; Xiao, Lun (Inst. At. Energy, Beijing, Peop. Rep. China). *He Huaxue Yu Fangshe Huaxue* 1983, 5(1), 9-17 (Ch). A selective adsorption and desorption on Cu based Pt adsorbent (CBPA) of radioiodine was studied. The I<sup>-</sup> can be adsorbed on CBPA in the media like sulfuric, citric or tartaric acid at pH ≤ 6.2. The adsorption capacity is ~0.7 mg/cm<sup>3</sup> CBPA (150-200 mesh) in the usual cycles. In the presence of enough Na<sub>2</sub>SO<sub>3</sub>, the adsorption efficiency is ≥ 99.95% before the breakthrough. The adsorption takes place in < 3 s, permitting a flow rate of ≤ 90 mL/cm<sup>2</sup>-min, while in elution, the flow rate should not exceed 10 mL/cm<sup>2</sup>-min to avoid longer tailing. The elution efficiency depends greatly on 2 factors: the amt. of I<sup>-</sup> adsorbed and the concn. of NaOH in the eluant. Na<sup>+</sup>, K<sup>+</sup>, Cs<sup>+</sup>, Cu<sup>2+</sup>, Zn<sup>2+</sup>, Fe<sup>2+</sup>, Al<sup>3+</sup>, Sb(III), and SO<sub>3</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup>, TeO<sub>4</sub><sup>2-</sup>, citrate, tartrate etc., and NO<sub>3</sub><sup>-</sup>, Cl<sup>-</sup> as well (in the pH range of 4-5.5 and with enough Na<sub>2</sub>SO<sub>3</sub> present), exhibit no apparent effect on either adsorption or desorption of I<sup>-</sup>. The presence of large quantity of Br<sup>-</sup> interferes both processes. The sepn. (or decontamination) factors for Al, Te(VI), Sb(III) are > 10<sup>3</sup>-10<sup>5</sup>. In 0.1N NaOH eluate, the contents of absorbent material (Cu and Pt) and other impurities are all < 1 ppm, and the radiochem. purity of radioiodine in the product is ≥ 99.9%, with no reducing agent in it. The column can be used repeatedly. A dose of 1 x 10<sup>8</sup> rads of <sup>60</sup>Co γ-rays has no effect on the effectiveness of the CBPA.

XP-002109380

6001 Chemical Abstracts, Columbus, Ohio, US

Vol. 90 (1979) 25 JUNE No. 26

Page: \_\_\_\_\_

90: 211942e Adsorption separation of iodine isotopes without a carrier. Makhkamova, M. Kh.; Bigelis, V. M.; Abrarov, O. A. (USSR). *Tezisy Dokl. - Konf. Anal. Khim. Radioakt. Elem.* 1977, 28 (Russ). Edited by Myasoedov, B. F.; Davydov, A. V. Izd. Nauka: Moscow, USSR. The adsorption of  $^{131}\text{I}$  on a Pt-electrode was studied for the purpose of investigating the possibility of sepg. I isotopes without a carrier. Starting from the theor. values of the std. potentials, the sorption properties of different anions on Pt and the soly. of  $\text{TeO}_2$  (the target for obtaining  $^{131}\text{I}$  in the reactor), the medium selected was a  $\text{HF-H}_2\text{SO}_4$  soln. In 1 L of a mixt. of  $\text{HF}$  25 +  $\text{H}_2\text{SO}_4$  1M, one can dissolve 1250 g of  $\text{TeO}_2$ . The I is adsorbed from  $\text{HF-H}_2\text{SO}_4$  soln. on a Pt electrode both with and without an applied (anodic) current. The max. adsorption was obsd. at 0.65-0.75 V (vs. std. H electrode). At more pos. potentials the adsorbed I dissolved as iodate. The sorption property of Pt depends on the method of pretreating the surface. The chem. state of the Te ions in the iodide solns. was studied. A method was developed for regenerating Te.

XP-002109381

1/1 - (C) WPI / DERWENT  
AN - 77-90911Y q51!  
PR - JP760049654 760430  
TI - Separation of iodine-132 from tellium-132 - by  
selective adsorption using copper or silver suspension  
and quartz or glass fibres  
IW - SEPARATE IODINE SELECT ADSORB COPPER SILVER SUSPENSION  
QUARTZ GLASS FIBRE  
PA - (JAAT ) JAPAN ATOMIC ENERGY RES INST  
PN - JP52133498 A 771108 DW7751 000pp  
- JP57039172B B 820819 DW8237 000pp  
ORD - 1977-11-08  
IC - B01D15/04 ; B01D59/26  
FS - CPI  
DC - K08  
AB - J52133498 Material capable of adsorbing or depositing  
Te-132 is added to a soln. contg. Te-132 generated from  
cpds. contg. U-235 irradiated with neutrons so as to  
adsorb or deposit Te-132 on its surface. After a  
predetermined period of time, the material absorbing or  
depositing Te-132 is removed from the soln. and heated  
in an atmos. of reducing gas to separate only I-132  
from Te-132. The separated I-132 is collected.  
- As material capable of adsorbing or depositing Te-132,  
copper or silver particles are used. As material for  
collecting I-132, quartz or glass wool is used.  
- In an example, 30g. of Cu particles (8-16 mesh) were  
added to 34.5ml. of a 1 M HCl soln. contg. Te-132.  
After 5 hrs., over 80% Te-132 was adsorbed on the  
surface of the Cu particles. The resultant Cu  
particles were washed with water, dried and then heated  
at 550 degrees C in a H2-He atmos. for 30 mins. to  
separate I-132 from Te-132. The I-132 was collected by  
quartz wool.